Utricularia neottioides

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Utricularia neottioides is a bizarre species native to the South American countries of Colombia, Venezuela, Bolivia, and Brazil (Taylor 1989). It grows anchored to rocks submerged by flowing water in cold mountain streams, a habit called rheophytic (Taylor 1989). I've observed on my trips around Brazil that *U. neottioides* prefers the acidic, Coca-Cola-colored waters common of streams flowing down from sandstone highlands. As I've been told, this acidity and bizarre color are a result of the tannic acid present in the water. The water may look dirty to most people, but is actually almost sterile and excellent for drinking, especially since it's usually extremely cold!

I've found *U. neottioides* growing at the Caraça Range, Cipó Range, around the town of Diamantina (all three in central Minas Gerais state), Canastra Range (southwestern M.Gerais), around the villages of Grão Mogol and Itacambira (both in northern M.Gerais), Ibitipoca Range (southeastern M.Gerais), Chapada dos Veadeiros (northern Goiás state, bordering the new state of Tocantins, which covers the top half of the old Goiás), Chapada dos Guimarães (southern Mato Grosso state), and have seen herbarium from many other localities in Brazil.

U. neottioides flowers more profusely in shallow, slow-flowing water, most often during the dry season, though it can be found flowering all year long. During the wet season, the bare, stiff stolons are often almost invisible, fixed tightly in web-like patterns to the submerged rock surfaces. I've been fortunate enough to discover sites where *U. neottioides* formed beautiful mats with thousands of flower scapes bearing tens of thousands of tiny greenish-white, yellowish-white, or cream flowers. Each peduncle bears 20 or more flowers and may reach 30cm in height (Taylor 1989), always flowering above the water level. Once at the Chapada dos Guimarães I observed *U. neottioides* right after sunset and it seemed to me as if the flowers were slightly closed, with the upper lip bending together with the three lobes of the lower lip.

The leaves of *U. neottioides* are unique in that they grow not only from the stolons, but also from the submerged, lowermost parts of the peduncles (Taylor 1989). Some kind of mucilage is produced by the leaves, which are long and feathery. At the Chapada dos Veadeiros I collected plants with leaves up to 20cm in length. The traps are extremely small and not very abundant either on the leaves or on the stolons, though at the Chapada dos Guimarães I've found leaves bearing numerous large red traps.

U. neottioides forms Section Avesicaria together with *U. oliveriana*, a species native to Brazil, Colombia, and Venezuela (Taylor 1989). In Brazil, *U. oliveriana* has only been collected in the states of Pará, Rondônia, and Goiás (Taylor 1989). A few main differences between *U. oliveriana* and *U. neottioides* are that the former has unbranched stolons, longer pedicels, and small, "normal-looking" *Utricularia* leaves (Taylor 1989). Unfortunately, I still haven't come across *U. oliveriana* in the wild. *U. neottioides* is often found growing is spots of strong current in streams. It's a mystery to me how seeds are able to fasten themselves to and germinate on rocks in swift-flowing water. In this case, I imagine the seeds could have originally germinated in shallow water near the streamsides and then the plants could have spread slowly over the rocks to the central parts of the stream. The seeds in Section Avesicaria are said to be sticky (Taylor 1989), which would help in anchoring themselves to rocks. They probably only become sticky after contact with water, since the ones I've collected from dead peduncles are always dry.

Maybe the seeds are not truly shed and actually germinate directly from the fruit

while still on the flower scape. This would be an advantage since loose seeds in the water will surely be carried further downstream than a dead peduncle which will get stuck somewhere among the rocks sooner. Or maybe the flower scapes could bend over into the water once dead, while remaining attached to the stolons. That would allow the seeds to germinate directly from the fruit onto the submerged rocks.

Of course these would only work if the seeds maintain their viability after drying out, which is usually not the case with aquatic *Utricularia*. I'm not sure how it works for *U. neottioides*, but I've seen dead plants covering the dry bed of an annual stream at the Chapada dos Guimarães. I don't think it's likely that a few fresh seeds were brought over by birds, wind, or whatever, and to have then developed into a fair-sized colony in a single season. Most likely, this population regenerates each year from a good quantity of seeds which just sit on the streambed until the wet season arrives. Maybe the dead scapes only release the seeds after the dry season is over, with the advent of rain.

Only on two occasions have I seen *U. neottioides* growing in a habitat other than bare submerged rocks. At the Chapada dos Guimarães I found plants growing in gravel mixed with sand in a shallow stream, which is not too strange, but was surprised when I discovered plants at the Chapada dos Veadeiros growing in reddish dirt covering a streambed. Just to make sure, I even dug below the plants with my hands to be certain that the dirt wasn't only a thin layer above bare rock.

I've brought back live plants from my trips, but these never last very long in cultivation, rotting off in stagnant water. *U. neottioides* grows in a very specific habitat and to cultivate it, you'd probably have to have a stream in your backyard. Live plants would have to be brought from the wild and quickly secured to rocks in your stream. Maybe gravel, sand or some type of soil mix might work too. But even if you did get live *U. neottioides* to a stream near you house, there's the problem of water pH and chemical composition, which are probably very important for the survival of this exotic *Utricularia*.

References:

Taylor, Peter. 1989. The Genus *Utricularia* - A Taxonomic Monograph. Kew Bulletin Additional Series XIV, Royal Botanic Gardens, Kew.

Figure 1. *Utricularia neottioides* growing in a shallow, rocky stream near Chapada dos Veadeiros, Brazil. Photo by Fernando Rivadavia.